

What is claimed is:

Sub A7
1. A coating comprising:
a first coating surface;
a second coating surface; and
at least one breaker layer located between the first
and second coating surfaces, the breaker layer configured to
interrupt a crystal structure of the coating.

10 2. The coating according to claim 1, wherein the
first and second coating surfaces are substantially
crystalline and the breaker layer is substantially amorphous.

Sub B2
15 3. The coating according to claim 1, wherein at
least one of the first and second coating surfaces comprises
at least one metal oxide and at least one dopant.

20 4. The coating according to claim 1, wherein the
breaker layer comprises at least one metal oxide and
phosphorous.

5. The coating according to claim 1, wherein the
breaker layer comprises at least one metal oxide and silicon.

25 6. A coating, comprising:
a substantially crystalline first layer;
a substantially crystalline second layer deposited
over the first layer; and
a breaker layer located between the first and second
30 layers, the breaker layer configured to prevent or at least
reduce epitaxial growth of the second layer on the first
layer.

Sub B3
35 7. The coating according to claim 6, wherein the
first layer comprises a metal oxide.

8. The coating according to claim 6, wherein the first layer comprises a metal oxide having at least one dopant.

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9. The coating according to claim 6, wherein the first layer has a thickness of about 1000 Å to about 2300 Å.

10. The coating according to claim 6, wherein at least one of the first and second layers comprises (a) a metal oxide selected from the group consisting of oxides of Zn, Fe, Mn, Al, Ti, In, Zr, Ce, Sn, Si, Cr, Sb, Co, and mixtures thereof, and (b) at least one dopant selected from the group consisting of Sn, Sb, F, In, and mixtures thereof.

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11. The coating according to claim 6, wherein the second layer has a thickness of about 2000 Å to about 5000 Å.

12. The coating according to claim 6, wherein the breaker layer comprises tin oxide and phosphorous.

13. The coating according to claim 6, wherein the breaker layer comprises tin oxide and silica.

14. The coating according to claim 6, wherein the breaker layer has a thickness of about 100 Å to about 1000 Å.

15. The coating according to claim 6, wherein the breaker layer is amorphous.

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16. A coating, comprising:
a substantially crystalline first layer comprising antimony doped tin oxide, the first layer having a thickness of about 1200 Å to about 2300 Å;

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a substantially crystalline second layer deposited over the first layer, the second layer comprising fluorine doped tin oxide and having a thickness of about 3000 Å to about 3600 Å; and

a breaker layer located between the first and second crystalline layers, the breaker layer configured to prevent or at least reduce epitaxial growth of the second layer on the first layer.

10 17. The coating according to claim 16, wherein the breaker layer has a thickness of about 100 Å to about 1000 Å and the breaker layer comprises tin oxide with at least one of phosphorous and silica.

15 18. A coated article, comprising:
a substrate; and
a coating deposited over at least a portion of the substrate, the coating comprising:
20 a first coating surface;
a second coating surface; and
at least one breaker layer located between the first and second coating surfaces and configured to interrupt a crystal structure of the coating.

25 19. The coating according to claim 18, wherein the first and second coating surfaces are substantially crystalline and the breaker layer is substantially amorphous.

30 20. The coating according to claim 18, wherein the first coating surface comprises at least one metal oxide.

21. The coating according to claim 20, wherein the first coating surface further comprises at least one dopant.

Sub A3

22. The coating according to claim 18, wherein the second coating surface comprises at least one metal oxide.

23. The coating according to claim 22, wherein the second coating surface further comprises at least one dopant.

24. The coating according to claim 18, wherein the breaker layer comprises at least one metal oxide and phosphorous.

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25. The coating according to claim 18, wherein the breaker layer comprises at least one metal oxide and silicon.

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26. A coated article, comprising:
a substrate;
a substantially crystalline first layer deposited over at least a portion of the substrate;
a breaker layer deposited over the first layer; and
a substantially crystalline second layer deposited over the breaker layer,
wherein the breaker layer is configured to inhibit epitaxial growth of the second crystalline layer on the first crystalline layer.

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27. The coated article according to claim 26, wherein the substrate is selected from the group consisting of glass, ceramic, and plastic.

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28. The coated article according to claim 26, wherein the first layer comprises a metal oxide and at least one dopant.

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29. The coated article according to claim 26, wherein the first layer comprises a metal oxide selected from the group consisting of oxides of Zn, Fe, Mn, Al, Ti, In, Zr,

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Ce, Sn, Si, Cr, Sb, Co, and mixtures thereof, and at least one dopant selected from the group consisting of Sn, Sb, F, In, and mixtures thereof.

5 30. The coated article according to claim 26, wherein the first layer has a thickness of about 1200 Å to about 2300 Å.

10 31. The coated article according to claim 26, wherein the breaker layer is amorphous.

15 32. The coated article according to claim 26, wherein the breaker layer has a thickness of about 100 Å to about 1000 Å.

 33. The coated article according to claim 26, wherein the breaker layer comprises tin oxide and phosphorous.

20 34. The coated article according to claim 26, wherein the breaker layer comprises tin oxide and silica.

25 35. The coated article according to claim 26, wherein the second layer comprises a metal oxide and at least one dopant.

 36. The coated article according to claim 35, wherein the second layer comprises a metal oxide selected from the group consisting of oxides of Zn, Fe, Mn, Al, Ti, In, Zr, Ce, Sn, Si, Cr, Sb, Co, and mixtures thereof, and at least one
30 dopant selected from the group consisting of Sn, Sb, F, In, and mixtures thereof.

 37. The coated article according to claim 26, wherein the first layer includes antimony doped tin oxide,

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with an atomic ratio of antimony to tin of about 8.0 to about 12.0

38. The coated article according to claim 35,
5 wherein the second layer comprises fluorine doped tin oxide,
with the fluorine present in an amount of less than about 5
atomic percent.

39. The coated article according to claim 33,
10 wherein the breaker layer has a phosphorous to tin atomic
ratio of about 0.001 to about 0.10.

40. The coated article according to claim 34,
wherein the breaker layer has a silicon to tin atomic ratio of
15 about 0.005 to about 0.050.

41. A coated article, comprising:
a substrate;
a substantially crystalline first layer deposited
20 over at least a portion of the substrate; and
a breaker layer deposited over at least a portion of
the first layer, the breaker layer configured to prevent or at
least reduce epitaxial growth of a subsequently deposited
crystalline layer over the first layer.

42. A coated article, comprising:
a substrate;
a graded color suppression layer deposited over at
least a portion of the substrate, wherein the color suppression
30 layer is about 50Å to about 3000Å thick; and
a first substantially transparent, conductive metal
oxide layer deposited over the color suppression layer,
wherein the conductive metal oxide layer is about 700Å to
about 3000Å thick.

43. The article as claimed in claim 42, wherein the conductive metal oxide layer includes at least two coating stratas.

5 44. The article as claimed in claim 42, including
a second substantially transparent, conductive metal oxide
layer deposited over the first conductive metal oxide layer,
wherein the second conductive metal oxide layer has a
thickness of about 0Å to about 3000Å, wherein the second
10 conductive metal oxide layer is fluorine doped tin oxide, and
wherein the thickness of the second layer is inversely
proportional to the thickness of the first layer.

15 ~~45.~~ A coated article, comprising:
a substrate;
an antimony doped tin oxide layer deposited over the
substrate and having a thickness of about 900Å to about 1500Å;
and
a fluorine doped tin oxide layer deposited over the
20 antimony doped tin oxide layer and having a thickness of about
1200Å to about 3600Å, wherein the antimony doped tin oxide
layer has at least two stratas of different antimony
concentrations, with a first strata having a thickness of
about 985Å and a second strata having a thickness of about
25 214Å.

30 ~~46.~~ A coated article, comprising:
a substrate;
a first doped metal oxide layer deposited over at
least a portion of the substrate; and
a second doped metal oxide layer deposited over the
first doped metal oxide layer, wherein the first doped metal
oxide layer has a lower refractive index than that of the
second doped metal oxide layer.

47. The article as claimed in claim 46, wherein the first doped metal oxide layer includes antimony doped tin oxide.

5 48. The article as claimed in claims 47, wherein the second doped metal oxide layer includes a doped metal oxide selected from the group consisting of fluorine doped tin oxide, indium doped tin oxide, and mixtures thereof.

10 49. A coated article, comprising:
a substrate;
a color suppression layer deposited over at least a portion of the substrate;
a substantially crystalline first layer deposited
15 over the color suppression layer;
a substantially crystalline second layer deposited over the first layer; and
a breaker layer located between the first and second layers, the breaker layer configured to prevent or reduce
20 epitaxial growth of the second layer on the first layer.

50. The article as claims in claim 49, wherein the breaker layer comprises a phosphorous containing material.

25 51. The article as claimed in claim 49, wherein the breaker layer comprises a silica containing material.

52. The article as claimed in claim 49, wherein the first layer comprises antimony doped tin oxide.

30 53. The article as claimed in claim 49, wherein the second layer comprises fluorine doped tin oxide.

54. A coated article, comprising:
a substrate;

a first coating region deposited over at least a portion of the substrate, the first coating region comprising a metal oxide and a first dopant;

5 a transition region deposited over the first region, the transition region comprising a metal oxide, the first dopant, and a second dopant, with the ratio of the first dopant to the second dopant constantly changing with distance from the substrate; and

10 a third coating region deposited over the second coating region, the third coating region comprising a metal oxide and the second dopant.

55. The coated article according to claim 54, wherein the metal oxides of the first, second, and third
15 coating regions are each tin oxide.

56. The coated article according to claim 54, wherein the first and second dopants are selected from antimony and fluorine.
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57. The coated article according to claim 54, including a color suppression layer located between the first region and the substrate.

25 58. The coated article according to claim 54, including at least one breaker layer located between at least two of the first region, transition region, or second region.

30 59. A method of coating a substrate, comprising the steps of:

depositing a substantially crystalline first layer over at least a portion of a substrate;

depositing a breaker layer over the first layer; and

35 depositing a substantially crystalline second layer over the breaker layer, wherein the breaker layer is

configured to prohibit or reduce epitaxial growth of the second crystalline layer on the first crystalline layer.

60. A method of coating a substrate, comprising
5 the steps of:

depositing a substantially crystalline first layer over at least a portion of a substrate; and

depositing a breaker layer over the first crystalline layer, wherein the breaker layer is configured to
10 prevent or at least reduce epitaxial growth of a subsequent crystalline layer onto the first crystalline layer.

61. A method of forming a coated article, comprising the steps of:

15 providing a substrate;

depositing a color suppression layer over at least a portion of the substrate, the color suppression layer having a thickness of about 50Å to about 3000Å;

20 depositing a first substantially transparent conductive metal oxide layer over the color suppression layer, the first conductive metal oxide layer comprising antimony doped tin oxide having a thickness of about 700Å to about 3000Å; and

25 depositing a second, substantially transparent, conductive metal oxide layer over the first conductive metal oxide layer, the second conductive metal oxide layer comprising fluorine doped oxide having a thickness of about 0Å to about 3000Å, with the thickness of the second layer being substantially inversely proportional to the thickness of the
30 first layer.

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